

WHAT IS CLAIMED IS:

1. A music tuner for tuning a music instrument, comprising:

5 a tuner body having a display screen to show a pitch of a sound from the music instrument and a difference from a target sound;

a non-contact sensing device that senses sounds from said music instrument through the air;

10 a contact sensing device that senses sounds from the music instrument by physically contacting with the music instrument;

an attachment clip for attaching the music tuner to an object including the music instrument; and

15 a circuitry to select either said non-contact sensing device or said contact sensing device for processing the sounds from the music instrument.

2. A music tuner for tuning a music instrument as defined in Claim 1, wherein said contact sensing device is mounted on the attachment clip.

20 3. A music tuner for tuning a music instrument as defined in Claim 1, wherein said non-contact sensing device is mounted on the tuner body, and wherein said tuner body is detachably connected to the attachment clip having said contact sensing device, thereby establishing the music tuner
25 having both said non-contact sensing device and said contact sensing device.

30 4. A music tuner for tuning a music instrument as defined in Claim 1, wherein said circuitry automatically selects either said non-contact sensing device or said contact sensing device by comparing an output level of the sensing device with a predetermined threshold level.

5. A music tuner for tuning a music instrument as defined in Claim 1, wherein said circuitry selects either said non-contact sensing device or said contact sensing

device in response to a manual operation of a switch provided on the music tuner.

5 6. A music tuner for tuning a music instrument as defined in Claim 1, wherein said attachment clip having said contact sensing device is detachable from said tuner body to allow said music tuner to function separately and independently from attachment clip.

10 7. A music tuner for tuning a music instrument as defined in Claim 4, wherein said circuitry selects the contact sensing device for picking the sound of the music instrument when an output level of said contact sensing device is larger than the predetermined threshold level.

15 8. A music tuner for tuning a music instrument as defined in Claim 4, wherein said circuitry selects the contact sensing device for picking the sound of the music instrument when an output level of said contact sensing device is larger than the predetermined threshold level, and wherein said circuitry determines whether a predetermined time has passed after the output level of said contact
20 sensing device fell below said predetermined threshold level and selects said non-contact sensing device only if said predetermined time has passed.

25 9. A music tuner for tuning a music instrument as defined in Claim 1, wherein said circuitry collects time period data of the sound of the music instrument detected by said sensing device, determines a fundamental frequency of the sound based on the collected time period data, and causes to display a difference between the fundamental frequency of the sound and a target sound.

30 10. A music tuner for tuning a music instrument as defined in Claim 1, wherein said tuner body is attached to said attachment clip in a manner rotatable in clockwise and counterclockwise directions, and wherein said tuner body is attached to said attachment clip in a manner pivotable in
35 backward and forward directions.

11. A music tuner for tuning a music instrument as defined in Claim 1, wherein said display screen displays a measured result of the sound from the music instrument either by a normal display mode or a mirror display mode,
5 wherein a lower frequency is displayed at a left side of the display screen and a higher frequency is displayed at a right side of the display screen in said normal display mode, while the lower frequency is displayed at the right side of the display screen and the higher frequency is
10 displayed at the left side of the display screen in said mirror display mode.

12. A music tuner for tuning a music instrument as defined in Claim 11, wherein said display screen displays a measured result of the sound from the music instrument both
15 by said normal display mode and said mirror display mode at the same time.

13. A method of tuning a music instrument by a music tuner having a non-contact sensing device and a contact sensing device to detect a sound from the music instrument,
20 comprising following the steps of:

comparing a signal level from the contact sensing device with a threshold level;

selecting the contact sensing device for measuring the sound of the music instrument when the signal level from the contact sensing device exceeds the threshold
25 level;

selecting the non-contact sensing device for measuring the sound of the music instrument when the signal level from the contact sensing device is smaller
30 than the threshold level for a time longer than a predetermined time period; and

processing the sound of the music instrument from the selected sensing device to detect a fundamental frequency of the sound of the music instrument, and

displaying a difference of pitch between the sound from the music instrument and a target sound.

14. A method of tuning a music instrument as defined in Claim 13, wherein said step of selecting the non-contact sensing device includes a step of determining whether the predetermined time has passed after the output level of said contact sensing device fell below said predetermined threshold level and selecting said non-contact sensing device only if said predetermined time has passed.

15. A method of tuning a music instrument as defined in Claim 13, wherein said step of displaying the difference of pitch includes a step of displaying a measured result of the sound from the music instrument either by a normal display mode or a mirror display mode, wherein a lower frequency is displayed at a left side of the display screen and a higher frequency is displayed at a right side of the display screen in said normal display mode, while the lower frequency is displayed at the right side of the display screen and the higher frequency is displayed at the left side of the display screen in said mirror display mode.

16. A method of tuning a music instrument as defined in Claim 15, wherein said step of displaying the difference of pitch includes a step of displaying a measured result of the sound from the music instrument both by said normal display mode and said mirror display mode at the same time.